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RESEARCH ARTICLE

New combination and redescription of *Bumba humile*, description of four new species and new records from Brazil (Araneae: Theraphosidae: Theraphosinae)

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ABSTRACT. The taxonomic history of *Bumba* Pérez-Miles, Bonaldo & Miglio, 2014 is mainly based on the inclusion of the new species. *Bumba* have been characterized by the type IV urticating setae present, retrolateral process on male palpal tibia, palpal bulb resting in a ventral distal excavation of palpal tibia, metatarsus I passes between the two branches of tibial apophysis when flexed, presence of spiniform setae on prolateral and retrolateral sides of maxillae and coxae I-IV. In this paper we include the row of teeth (denticulate row) in the median region of the inferior prolateral keel in all male palps. This structure range from a residual tooth to a ridge of up to five teeth. Both, the denticulate row and the retrolateral process on male palpal tibia in males could be considered as putative synapomorphies for *Bumba*. Here, *Homoemma humile* Vellard, 1924 is transferred to *Bumba* and redescribed, while the female is described for the first time. *Bumba cabocla* (Pérez-Miles, 2000) is synonymyzed with *B. horrida* (Schmidt, 1994). *Bumba pulcherrimaklaasi* (Schmidt, 1991) is transferred to *Cyclosternum* Ausserer, 1871. Four new species are described and illustrated: *Bumba tapajos* **sp. nov.** from state of Pará, *Bumba cuiaba* **sp. nov.** and *Bumba rondonia* **sp. nov.**, both from states of Rondônia and Mato Grosso, respectively, and *Bumba mineiros* **sp. nov.** from Paraguay and the Brazilian states of Goiás, Mato Grosso and Mato Grosso do Sul. Diagnosis of *B. horrida* and *B. lennoni* are extended and figures of this species are presented.

KEY WORDS. Brazilian cerrado, *Cyclosternum*, mygalomorph spiders, taxonomy.

INTRODUCTION

Bumba Pérez-Miles, Bonaldo & Miglio, 2014, presents a rugged nomenclatural history. Pérez-Miles (2000) proposed *Iracema* for these mygalomorphs, but this name was preoccupied by a Neotropical fish (Triques 1996). This name was replaced by *Maraca* Pérez-Miles, 2005, but again a Neotropical cockroach (Hebard 1926) preoccupied this name. Only in 2014 was, the problem solved with *Bumba*'s proposition to include the Neotropical species.

Among these four species, only two are found in Brazil, *Bumba cabocla* (Pérez-Miles, 2000), the type species and *B. lennoni* Pérez-Miles, Bonaldo & Miglio, 2014; *B. horrida* (Schmidt, 1994) with occurrence in Brazil and Venezuela; and *B. pulcherrimaklaasi* (Schmidt, 1991) restricted to Ecuador (WSC 2019).

The study of type material and new specimens from several Brazilian collections offered us the possibility to improve the genus diagnosis, and transfer *Homoemma humile* Vellard, 1924 to *Bumba* and *B. pulcherrimaklaasi* to *Cyclosternum* Ausserer, 1871. In addition, one synonymy (*Bumba cabocla* with *B. horrida*) and four new species from Brazil are described:

Bumba tapajos sp. nov., *Bumba cuiaba* sp. nov., *Bumba rondonia* sp. nov. and *Bumba mineiros* sp. nov. Also included were illustrations of the diagnostic structures of specimens of *Bumba horrida* and *B. lennoni*.

MATERIAL AND METHODS

The examined species are deposited in the following Brazilian collections (curators in parenthesis): Instituto Butantan, São Paulo (IBSP, A.D. Brescovit), Museu Paraense Emilio Goeldi, Belém (MPEG, A.B. Bonaldo) and Instituto Nacional de Pesquisas do Amazonas (INPA, C. Magalhães).

Male palpal bulb terminology follows Bertani (2000). The number and spine disposition follows Petrunkevitch (1925). All measurements are in millimeters (mm) and were taken using a Leica DFC425 stereomicroscope. The length of leg segments

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were measured between joints, in dorsal view. Total body length excludes chelicerae and spinnerets. The extended focal range images composed with Leica Application Suite version 2.5.0. For scanning electron microscopy (SEM) images, body parts were dehydrated in a series of graded ethanol washes (80 to 100%), dried to critical point, mounted on metal stubs using adhesive copper tape and nail polish for fixation and covered with gold. SEM photographs were taken with a FEI Quanta 250 scanning electron microscope at the Laboratório de Biologia Celular of Instituto Butantan, São Paulo, Brazil. Spermathecae were dissected and immerse in enzyme (Ultrazyme®) for 72 hours for soft tissue digestion to allow observation of internal structures.

Geographic coordinates were obtained using Google Earth (Lat/Long – WGS84) and species distribution maps were made using the DIVA-GIS 7.5 program. Morphological abbreviations: (ALE) anterior lateral eyes, (AME) anterior median eyes, (PS) prolateral superior keel, (PI) prolateral inferior keel, (PLE) posterior lateral eyes, (DR) denticulate row.

TAXONOMY

Bumba Pérez-Miles, Bonaldo & Miglio, 2014

Iracema Pérez-Miles, 2000: 141 Type species: *Iracema cabocla* Pérez-Miles 2000 (original designation, currently *B. cabocla* (Pérez-Miles, 2000) = *B. horrida* (Schmidt, 1994), **syn. nov.**

Maraca Pérez-Miles, 2006: 147 (new name for *Iracema*, preoccupied by Triques 1996).

Bumba Pérez-Miles, Bonaldo & Miglio, 2014: 3 (new name for *Maraca*, preoccupied by Hebard 1926).

Diagnosis. *Bumba* species have been characterized by the following character combination: type IV urticating setae present, retrolateral process on male palpal tibia, palpal bulb resting in a ventral distal excavation of palpal tibia, metatarsus I passes between the two branches of tibial apophysis when flexed, presence of spiniform setae on prolateral and retrolateral sides of maxillae and coxae I-IV (Pérez-Miles 2000, Bertani and Carla-da-Silva 2003, Pérez-Miles et al. 2014). Here we suggest the inclusion of the row of teeth (denticulate row) in the median region of the inferior prolateral keel (Figs 2, 27, 36). This structure is present on all male palps, which may range from a residual tooth (Fig. 34) to a ridge of up to five teeth (Figs 38–40). Both the denticulate row and the retrolateral process on male palpal tibia could be considered as putative synapomorphies for this genus.

Bumba humile (Vellard, 1924), comb. nov.

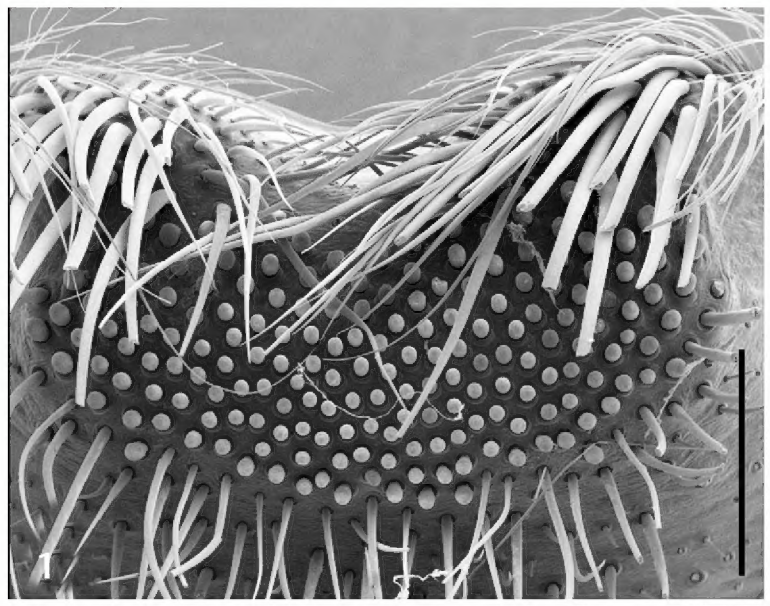
Figs 1–2, 8–14, 55, 56–61

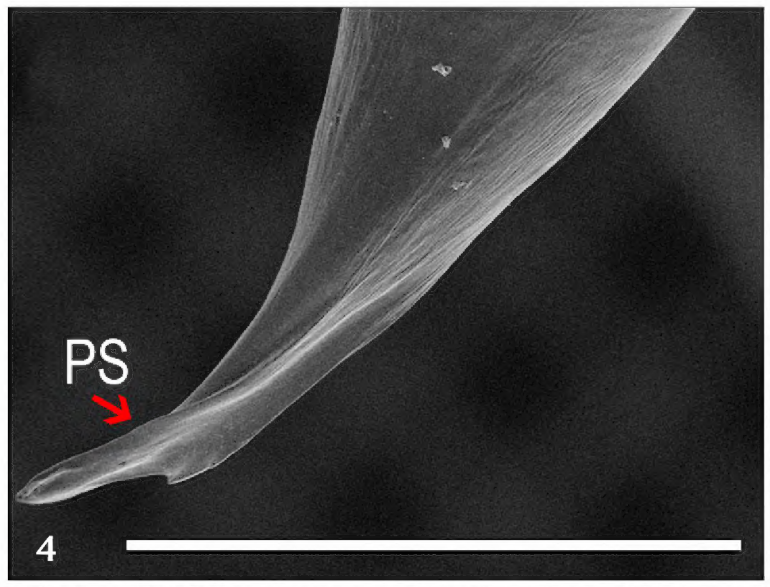
Homoeomma humile Vellard, 1924: 150, pl. 10, fig. 37a–d (Holotype male from Catalão (18°9'57"S; 47°56'47"W), Goiás, Brazil. M.F. Borges leg, deposited in Instituto Vital Brazil, Niterói, Rio de Janeiro, Brazil, lost).

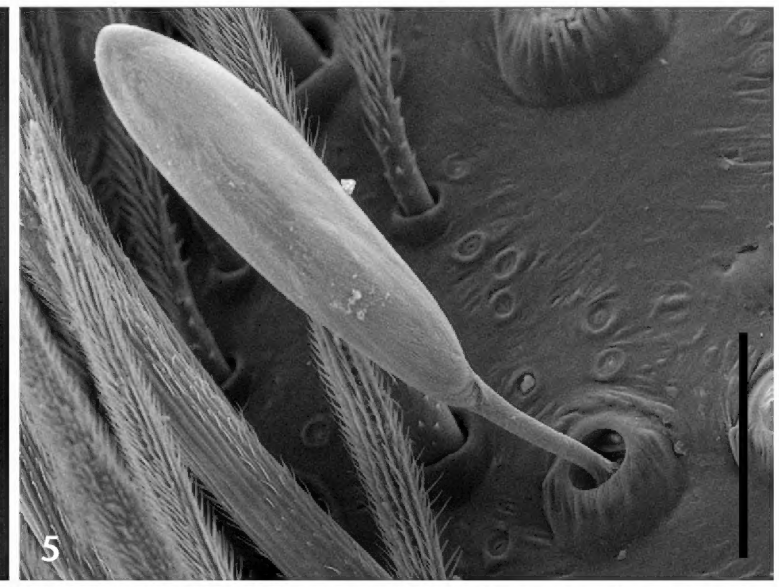
Diagnosis. Males of *Bumba humile* can be distinguished from the other species by the very high number of labial cuspules, over 200 (Fig. 1). *Bumba humile* resembles *B. tapajos* due to the presence of teeth (DR) on PI (Fig. 10) but the same are less evident, the embolus tapers towards the apex (Fig. 10) and retrolateral branch of tibial apophysis without apical spine (Fig. 9). *Bumba humile* females can be distinguished from the others by strongly inclined necks and reniform distal lobes (Figs 13–14).

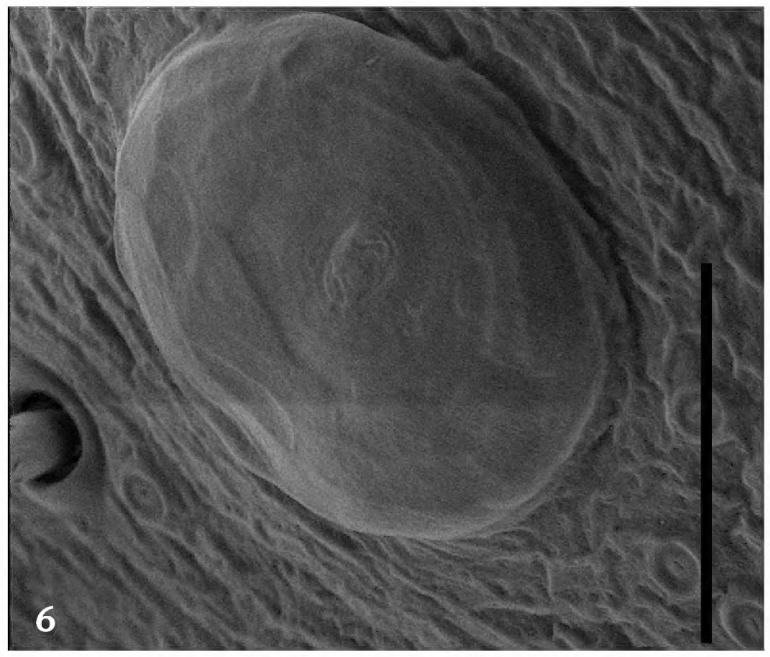
Description. Male (IBSP 12335). Color in vivo: cephalothorax deep brown recovered by dense setae mainly on the margin of same; sternum, coxae, labium and legs with long setae like the carapace; patella and tibia with two dorsal longitudinal lines without setae, abdomen with long reddish setae like the same which covered the legs (Figs 58–59, adult male) and juveniles blackish (Figs 56–57). Total length (not including chelicerae and spinnerets) 30.40.Carapace 15.50 long, 13.20 wide. Fovea deep procurve and small. Eye tubercle: 1.76 long, 2.04 wide. Anterior row of eyes procurve, posterior recurve. Eye size: AME 0.56, ALE 0.65, PME 0.43, PLE 0.44. Labium: 1.68 long, 2.56 wide with more than 200 cuspules. Sternum: 7.68 long, 6.24 wide. Cheliceral furrow with12 teeth on the prolateral margin. Maxillae with more than 200 cuspules on each side. Palp: femur 9.50/ patella 4.63/ tibia 6.00/ cymbium 2.25/ total 22.38. Leg I: femur 13.75/ patella 7.75/ tibia 10.25, metatarsus 10.38/ tarsus 5.50/ total 47.63; II: 12.88/ 7.00/ 9.25/ 9.88/ 5.63/ 44.63; III: 11.00/5.75/ 7.63/ 11.00/ 5.38/ 40.75; IV: 14.00/ 6.13/ 10.50/ 15.63/ 6.38/ 52.63. Spination: all tarsi without spines. Palp: femur d1-1-0, patella p0-1-0, tibia v2-0-4, p0-1-1; Leg I: femur p0-1-1, patella p0-1-0, r2-2-20, tibia v2-2-2-1ap, p0-1-0, r0-1-0, metatarsus v2-2-2-2, p1-1-0; II: femur d2-2-1, patella p0-1-0, r1-1-0, tibia v2-2-2-1ap, p0-1-0, metatarsus v2-2-2-3, p1-1-1; III: femur d2-2-0, patella p1-1-1, tibia v2-2-2-2, p2-2-0, r1-1-0, metatarsus v2-2-2-3, p2-2-2, r2-2-1; IV: femur d2-1p-0, patella p1-1-0, tibia 1p-2-2-2-3, p1-1-0, r1-1-1, metatarsus v2-2-2-1p, p1-1-1, r2-2-1. Scopulae: metatarsus I–II scopulate on more than distal half, III on distal third and IV only apical, distal fourth. Tarsi I - IV densely scopulate, III with some little spines on longitudinal division, IV with a larger division. Two tibial apophysis originating from a common base, the retrolateral branch granulated on apex, one spine laterally (Fig. 9). Palpal bulb with PS and PI keels, DR with 4-7 teeth on PI and enlarged tip of embolus (Figs 8, 10–12). Urticating setae III and IV present.

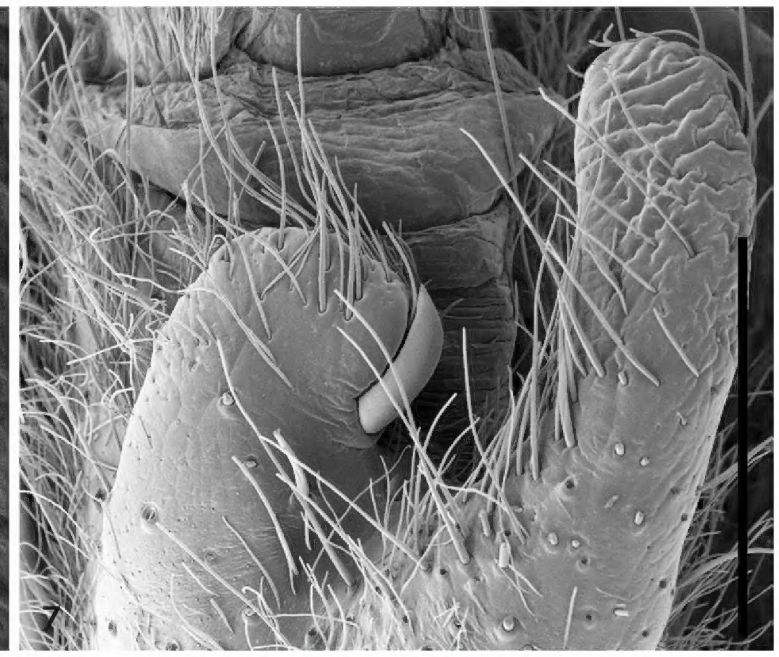
Female (IBSP 163660). Color as in male. Total length 40.4. Carapace 21.7 long, 19.3 wide. Fovea straight. Eye tubercle 1.9 long, 2.9 wide. Eye sizes: AME 0.36, ALE 0.64, PME 0.56, PLE 0.6. Labium 3.2 long, 3.4 wide, with ca. 250 cuspules. Maxillae with ca. 280 cuspules each. Sternum 9.2 long, 8.7 wide. Cheliceral furrow with 10 teeth. Palp, femur 11.3/ patella 7.2/ tibia 7.8/ tarsus 6.3/ total 32.6. Legs I: femur 15.6/ patella 9.8/ tibia 10.4/ metatarsus 8.5/ tarsus 4.1/ total 48.4; II: 14.5/ 9.2/ 8.8/ 8.9/ 5.1/ 46.5; III: 12.6/ 7.6/ 7.2/ 12.1/ 4.7/ 44.2; IV: 15.7/ 8.3/ 9.8/ 15.1/ 6.3/ 55.2. Spines: palp, femur d0-0-1p, tibia v0-1r-2, p0-1-1. Leg I: femur d0-0-1p, tibia v1r-1r-3ap, p1-1-0; metatarsus v1r-1-3ap; II: femur d0-1-1p, tibia v1r-1r-3ap, p1-1-0, metatarsus v1p-1-3ap; III: femur d0-0-2, tibia v1-1-2, p1-1-0, r1-1-0, metatarsus



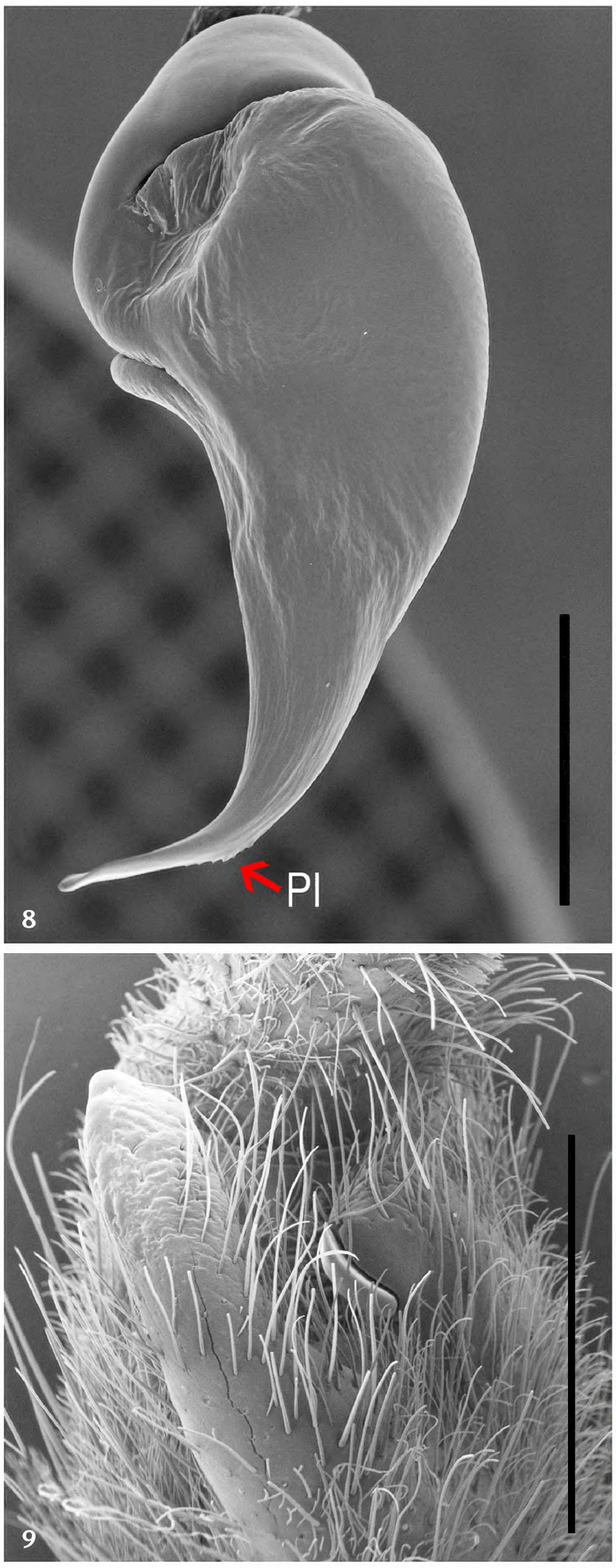


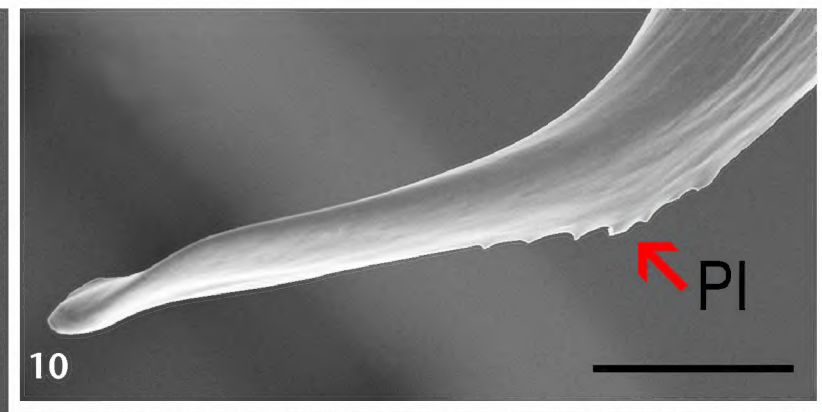


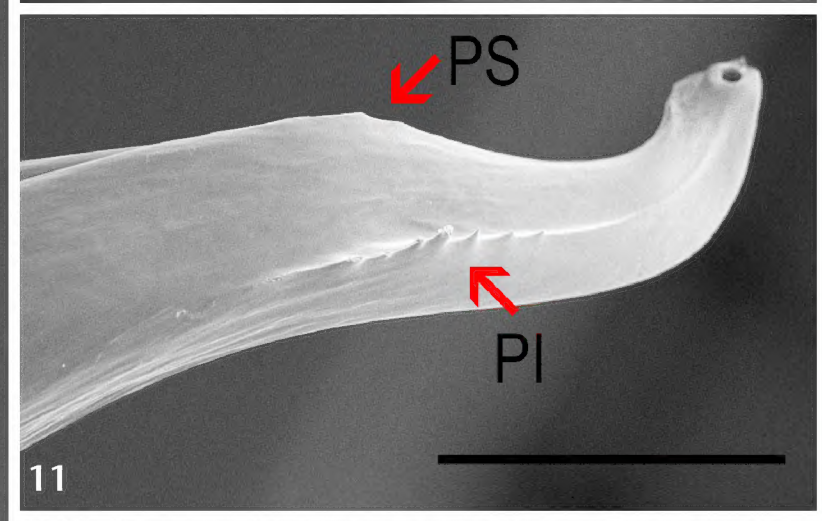


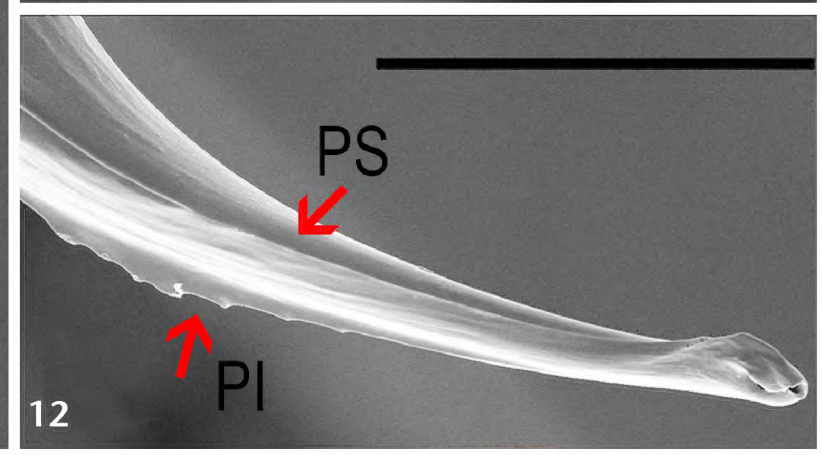


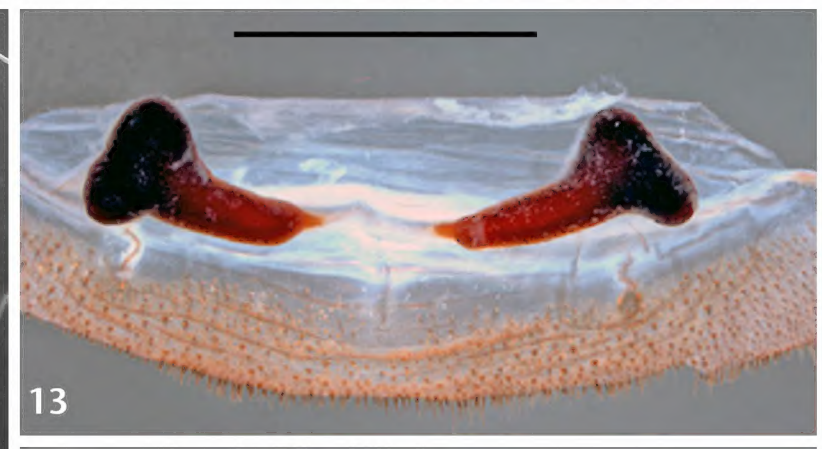
Figures 1–7. *Bumba* morphological characters: (1) Cuspules on labium (*Bumba humile*, male, IBSP 112330); (2) detail of embolus tip (*B. humile*, male, IBSP 119888); (3) palp of *B. mineiros* sp. nov., retrolateral view, left leg (male, IBSP 112230); (4) detail of embolous tip (*B. lenoni*, male, IBSP 229902); (5) tricobothria of leg I *B. mineiros* sp. nov. (male, IBSP 112230); (6) tarsal organ male leg I *B. mineiros* sp. nov. (male, IBSP 112230); (7) tibial apophysis of *B. tapajos* sp. nov., ventral view, left leg (male, IBSP 213497). Scale bars: 1 = 500 mm; 2 = 200 μm; 3 = 1 mm; 4 = 1 mm; 5, 6 = 50 μm; 7 = 2 mm.

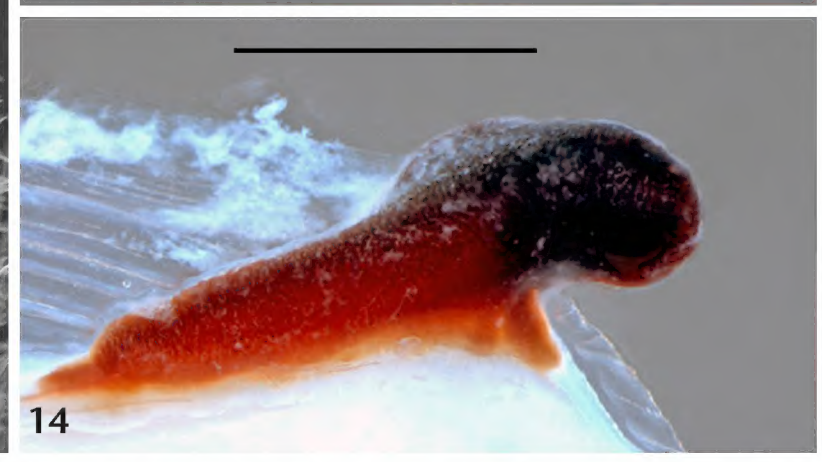












Figures 8–14. *Bumba humile* male, IBSP 112330, female, IBSP 133660: (8) bulb in retrolateral view; (9, 10, 11) detail of embolus tip; (12) tibial apophysis, Left leg I, ventral view; (13) female genitalia, dorsal view; (14) detail of female genitalia, dorsal view. Scale bars: 8 = 1 mm; 9, 10, 11 = 200 µm; 12, 13 = 2 mm; 14 = 500 µm.

v2-1p-1p-2, p1-1-0, r1-1-0; IV: femur d0-0-1r, tibia v1-1-2, p0-1-0, r0-1-0, metatarsus v1-p-2-2-2-1ap, p1-1-1, r1-1-1. Scopulae on metatarsi I–II 2/3 apical, III and IV only a small apical tuft, all tarsal scopulae integrae, but the IV with only some setae, in longitudinal line. Spermathecae with separate necks (Figs 13–14).

Material examined. BRAZIL, *Goiás*: 1 male (IBSP 111800); Alto Paraíso (14°07'57"S 47°30'36"W), 08/VIII/1997, C. Nogueira leg., 1 male (IBSP 12334); Catalão, Santo Antonio do Rio Verde (18°9'57"S; 47°56'47"W), 17/III/1997, J.B. Alves leg., 1 male (IBSP 12335); Ipameri (17°43'19"S; 48°09'35"W), V/1983, J. Ponezolla Junior leg., 1 male (IBSP 104780); *Minas Gerais*: Januária, Parque Nacional das Cavernas do Peruaçu (15°10'0"S; 44°22'0"W), 10–31/VII/2008, M. Teixeira Jr. & R. Recoder leg.,1 male (IBSP 119897); 2 males, same data (IBSP 119888); Chapada Gaúcha, Parque Nacional Grande Sertão Veredas (15°18'21"S; 45°37'06"W), 11/VII/2011, J.P.P.P. Barbosa leg., 1 male (IBSP 209037); Bahia: Casa Nova (09°09'43"S; 40°58'15"W), 12/II/2010, A. C. Guimarães leg., 1 female (IBSP 133660), São Desidério (12°21'8"S; 44°59'3"W), VII/2019. V. Ghirotto leg, 1 male (IBSP 2424979); *São Paulo*: Morro Agudo (20°43'53"S; 48°03'28"W), 10/V/1998, G. Palhares leg., 1 male (IBSP 112330).

Distribution. Brazil: states of Goiás, Minas Gerais, Bahia and São Paulo (Fig. 55).

Remarks. The presence of a retrolateral process on male palpal tibia, palpal bulb embolus with PS and PI keels (Figs 8, 10–12), two tibial apophysis (Fig. 9), metatarsus I bent between the two, urticating setae of type III and IV on abdomen, presence of spiniform setae on palp and coxae I–IV, justify the transference of *Homoemma humile* to *Bumba*. The female has the same coloration of males and the occurrence of males of the species in São Desidério and Casa Nova, Bahia led us to associate males and females in this work.

Bumba rondonia sp. nov.

http://zoobank.org/595D6B99-30B2-462A-8DEC-455059BBA818

Figs 15–21, 55

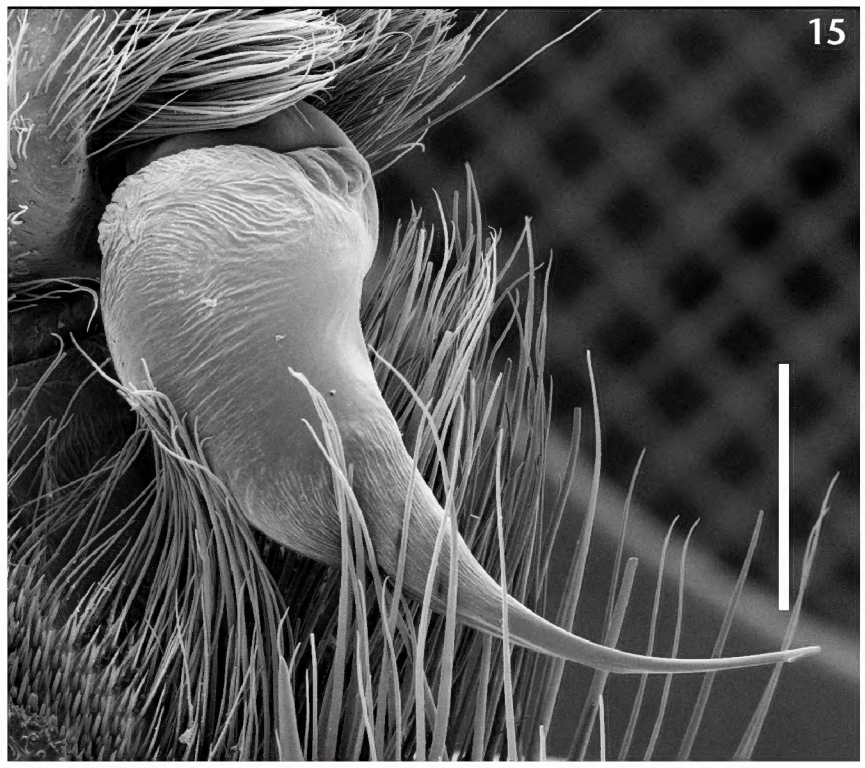
Type material. Holotype male from UHE Samuel, Candeias do Jamari (08°45'01"S; 63°27'20"W), Rondônia, Brazil, 1989, Equipe Resgate de Fauna leg. (IBSP 13013). Paratypes: three females, with same data as holotype (IBSP 14295; IBSP 14297; IBSP 13014).

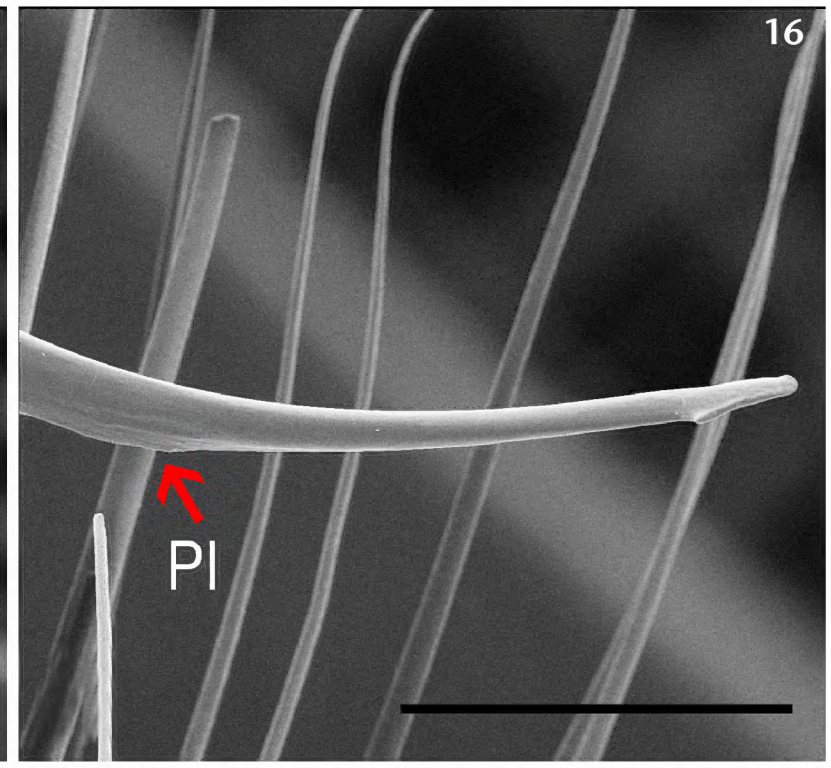
Diagnosis. Males of *Bumba rondonia* sp. nov. resemble *B. mineiros* sp. nov. by the long, thin and curved embolus with only PI visible and a tooth on DR (Fig. 18); but could be distinguished by the longer embolus and the tooth on PI less evident (Fig. 16). Females are similar to *B. mineiros* sp. nov. due to the aspect of the seminal receptacles but *B. rondonia* sp. nov. have straight and elongated necks, not curved (Figs 20–21).

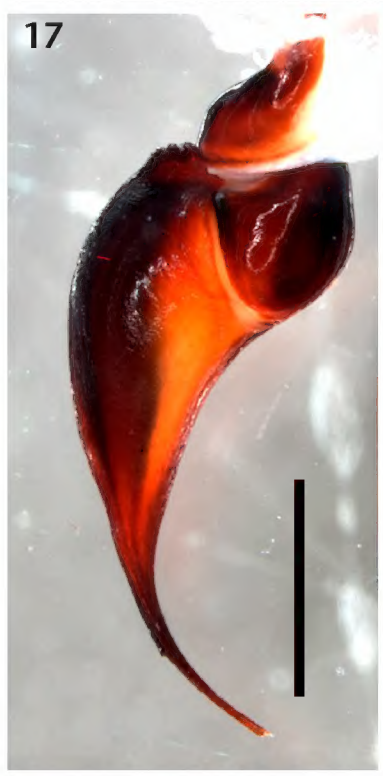
Description. Male (IBSP 13013, holotype). Color in ethanol: carapace, chelicerae and legs reddish brown. Labium and maxillae orange. Abdomen dorsally dark brown and ventrally orange. Ventral surface covered with dense short yellowish setae. Spinnerets yellow. Total length 26.5. Carapace 13 long, 11.6 wide. Fovea procurved. Eye tubercle rectangular, 2.2 long, 4 wide. Anterior eye row procurved, posterior recurved. Eye sizes: AME 0.4, ALE 0.52, PME 0.31, PLE 0.42. Labium 1.1 long, 2.1 wide, with ca. 60 cuspules, very little covering the anterior half. Maxillae with ca. 200 cuspules each. Sternum 5.4 long, 4.7 wide. Cheliceral furrow with 12 teeth. Palp, femur 6.6/ patella 3.4/ tibia 6.1/ cymbium 2.2/ total 18.3; Legs I: femur 12.4/ patella 6.4/ tibia 11/ metatarsus 9.3/ tarsus 5.4/ total 44.5; II: 11.4/ 5.3/ 9/ 9.1/ 5.4/ 40.2; III: 9.4/ 4.4/ 7.6/ 9.8/ 5.2/ 36.4; IV: 12.4/ 5.1/ 10.3/ 14.8/ 6.3/ 48.9. Spines: palp, tibia v0–1–0, r1–1–1–0. Leg I: tibia v0–1–1ap, metatarsus v1–1–0; II: tibia v1–1–1–3, metatarsus v2–2–1r–3; III: femur d0–1p–2, tibia v0–0–1r–1r, p1–1–1, r0–2–2, metatarsus v1r–2–2–1r, r0–1–1, p1–1–1; IV: femur d0–0–1p, tibia v1p–1p–2, p1–1–0, r1–1–1, metatarsus v2–0–1–1–3ap, p1–1–2–1, r1–2–2–1. Scopulae: metatarsi I–II until half, III only an apical tuft, IV without. All tarsi with dense scopulae, IV with a small longitudinal division of setae. Male palpal bulb with long embolus, longer than tegulum, PI with a weakly developed and poorly evident tooth on the middle region of PI (Figs 15–18), PS invisible. Tibial apophysis without spine on retrolateral branch of tibial apophysis, and laterally one spine (Fig. 19).

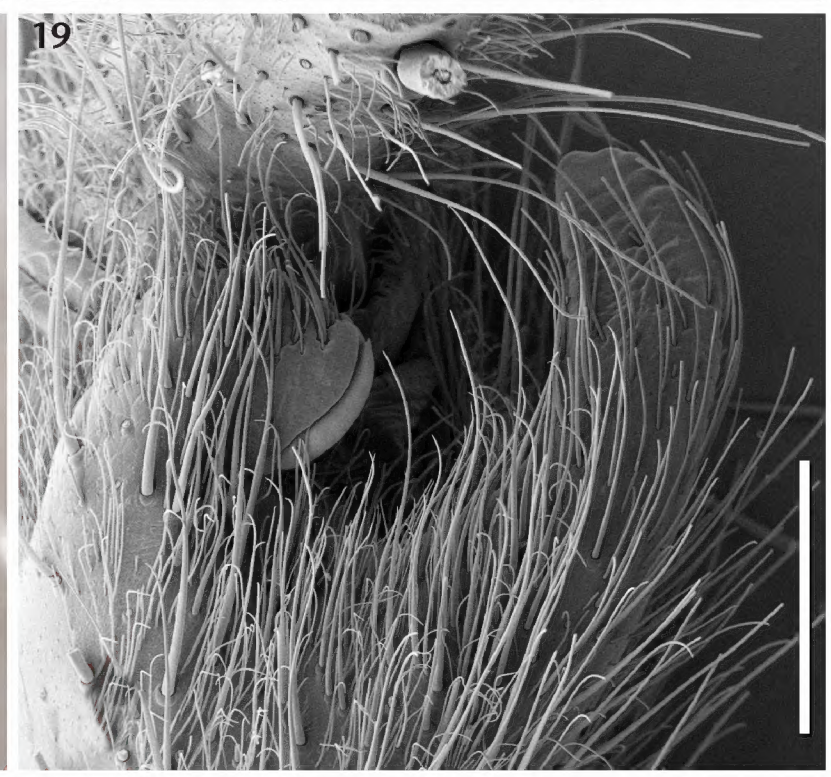
Female (IBSP 14295). Coloration as in male. Total length 39.2. Carapace 18.2 long, 16.7 wide. Fovea procurved. Eye tubercle rectangular, 1.1 long, 2.5 wide. Anterior eye row procurved, posterior recurved. Eye sizes: AME 0.48, ALE 0.62, PME 0.36, PLE 0.54. Labium 2.1 long, 2.5 wide, with more than 65 cuspules. Maxillae with more than 240 cuspules each. Sternum 8.8 long, 7.5 wide. Cheliceral furrow with 14 teeth. Palp, femur 9.4/ patella 6/ tibia 7/ tarsus 5.4/ total 27.8; Legs: I: femur 14.8/ patella 8.4/ tibia 11.3/ metatarsus 8.2/ tarsus 4.4/ total 47.1; II: 9.6/ 5.7/ 7/ 6.7/ 3.8/ 32.9; III: 8.6/ 4.6/ 6.2/ 8.6/ 3.8/ 31.8; IV: 10.4/ 4.8/ 8/ 11.7/ 4.1/ 39. Spines: palp, tibia v1r–1p–2, r0–0–1. Leg I: femur d0–0–1, tibia v1r–1r–2, p0–0–1, metatarsus v0–1–1; II: femur d0–0–1, tibia v1r–2r–1r–4, p0–1–1, metatarsus v1–1–1–2, p0–1–0; III: femur d1r–2, tibia v0–1–3, metatarsus v1–1–1–3, r1–1–1–1–1, p1–2–2–1; IV: femur d0–0–1r, tibia v0–1–3, metatarsus v1–1–1–3, r1–1–1–1–1, p1–2–2—1. Scopulae: metatarsi I–II until base, more developed on prolateral side, III only apical, IV without; all tarsi with dense scopulae, tarsi IV with a large longitudinal division of setae, larger than on male. Spermathecae with two seminal receptacles and bilobate apex (Figs 20–21).

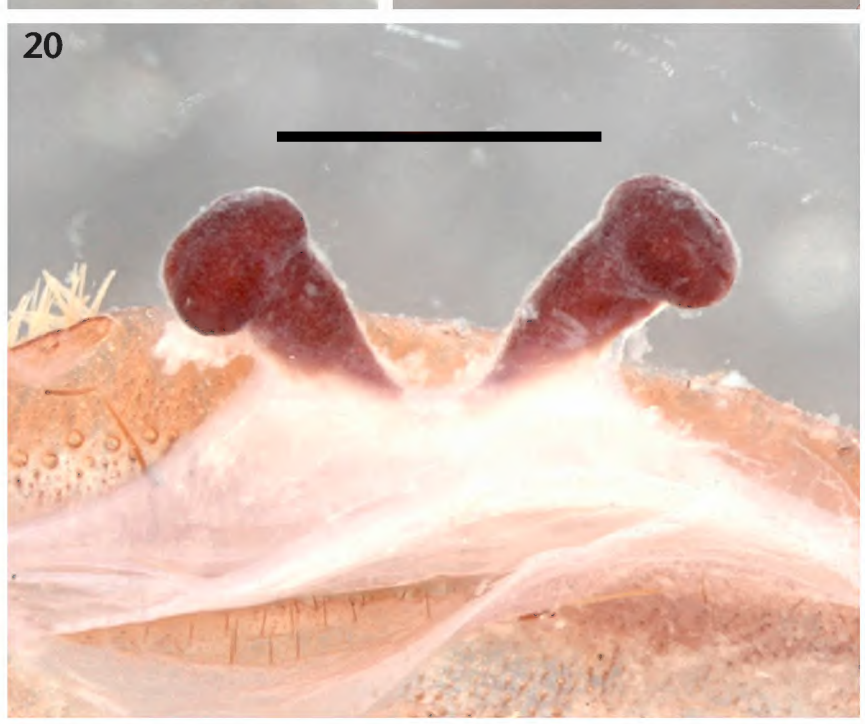
Material examined. BRAZIL, *Rondônia*: Candeias do Jamari (08°45'01"S; 63°27'20"W), UHE Samuel, I-II/1989, Equipe de Resgate de Fauna do Instituto Butantan col., 1 female (IBSP 113014), 1 female (IBSP 112215), 1 female (IBSP 114297), 1 female (IBSP 112222), 1 male (IBSP 114303), 1 female (IBSP 114296); Porto Velho (08°45'43'S; 63°54'14"W), 2007, L.S.P. Trigueiro leg., 1 male (IBSP 115313); *Mato Grosso*: Cáceres (16°04'14"S; 57°40'44"W), 2007, Equipe Universidade Federal de Mato Grosso leg., 1 female (IBSP 112232); same locality, 1997, M. Calleffo leg., 3 immature females (IBSP 111813); Comodoro (13°39'47"S; 59°47'09"W), 2009, D.M. Pereira leg., 4 males (IBSP 151864, 151865, 151867, 151868).

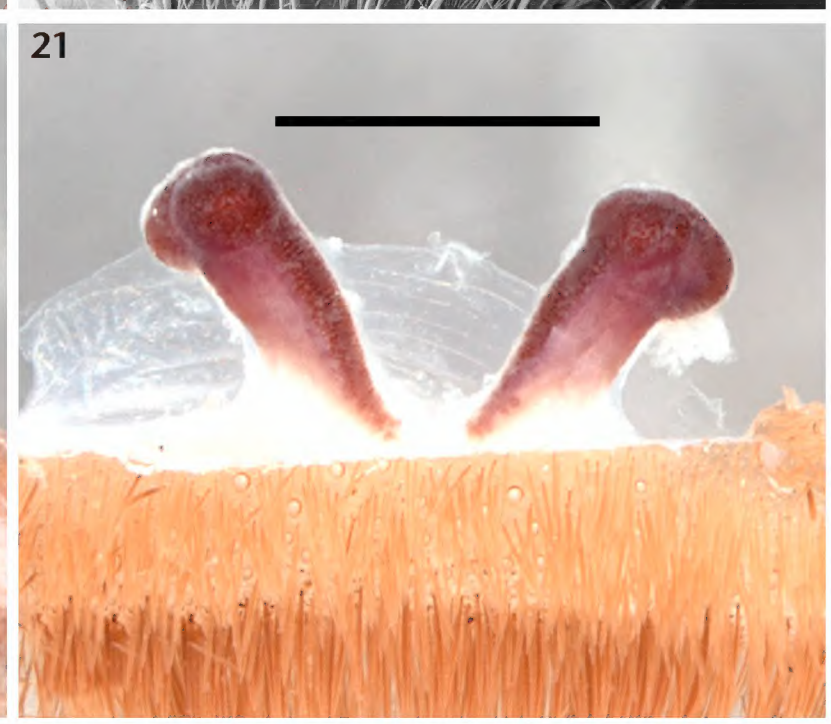












Figures 15–21. *Bumba rondonia* sp. nov. male, IBSP 151868, IBSP 113013 and female IBSP 113015: (15) bulb in prolateral view; (16) detail of embolus tip; (17) bulb in prolateral view; (18) bulb in retrolateral view; (19) tibial apophysis, left leg I, ventral view; (20) female genitalia, dorsal view; (21) female genitalia, ventral view. Scale bars: 15 = 1 mm; 16 = 500 µm; 17, 18 = 1 mm; 19 = 1 mm; 20, 21 = 500 µm.

Distribution. Brazil, states of Rondônia and Mato Grosso (Fig. 55).

Etymology. The species epithet is a noun in apposition taken from the Brazilian state of Rondônia.

Bumba mineiros sp. nov.

http://zoobank.org/F3825758-3333-4C3F-8433-EAEA4BC4E125
Figs 22–28, 55 RG 1979, 14.X..2002

Type material. Holotype male from Parque Nacional das Emas (18°6'23"S; 52°55'40"W), Mineiros, Goiás, Brazil, 28/VII/1997, Valdujo and Nogueira leg. (IBSP 112328). Paratype female from UHE Guaporé (15°07"S; 58°58"W), Rio Guaporé, Pontes e Lacerda/Vale de São Domingos, Mato Grosso, Brazil, 14/X/2002, Equipe Resgate Fauna leg. (IBSP112231).

Diagnosis. Males of *Bumba mineiros* sp. nov. resemble *B. rondonia* sp. nov. by the palpal bulb with a long and thin embolus with weakly developed keels (Figs 22–23), with only PI visible but the tooth on PI is more evident (Fig. 27) and the embolus is shorter than that of *B. rondonia* sp. nov. Females could be distinguished from *Bumba rondonia* sp. nov. by the curved necks of the seminal receptacles (Fig. 28).

Description. Male (IBSP 112328, holotype). Color in ethanol: cephalothorax and legs reddish brown, abdomen dorsally black and ventrally grayish. Total length 24.1. Carapace 12.3 long, 10.5 wide. Fovea almost straight. Eye tubercle rectangular, 0.9 long, 1.9 wide. Anterior eye row little procurved, posterior recurved. Eye sizes: AME 0.36, ALE 0.42, PME 0.26, PLE 0.4. Labium 1.5 long, 2 wide, with ca. 100 cuspules covering the anterior half. Maxillae with more than 300 cuspules each. Sternum 5.2 long, 3.7 wide. Cheliceral furrow with 11 teeth. Palp: femur 6.4/ patella 3/ tibia 5.6/ cymbium 2.3/ total 17.3; Legs: I: femur 11.4/ patella 6.2/ tibia 8.5/ metatarsus 8.4/ tarsus 4.1/ total 38.6; II: 10.3/ 5.5/ 7.5/ 7.8/ 4.4/ 35.5; III: 8.8/ 4.4/ 6.3/ 8.8/ 4.6/ 32.9; IV: 10.7/ 5.1/ 8.7/ 12.2/ 5.2/ 41.9. Spines: palp, femur v0-1-0, p1-2-0. Leg I: femur d1p-1p, patela v1p, tíbia v1r-2r, p1-1-0, metatarso v0-1-1, p0-1-0; II: femur d1p-1p, patella v1p, tibia v1r-1-1r-2, p1-1-0, metatarsus v1-1-1, p1-1-0; III: femur r-0-1-1, tibia v2-1r-2-1p, p1-1-10, r1-1-1, metatarsus v2-2-3, p1-1-1-1, r1-1-1; IV: femur d1-0-1p-1p, tibia v2-2-2, p1-1-1, r1-1-1, metatarsus v2-1-2-1p-2-1p-2, p1-1-1-1, r1-1-1-1. All tarsi with dense scopula, the last with a longitudinal line of setae. Metatarsi I–II with scopula on distal half, III only apical, IV without scopula. Tarsal scopula integrae on legs. Palpal bulb piriform with a long and curved embolus with only PI visible (Figs 22–25, 27). Tibial apophysis with two branches, retrolateral branch with a rugous apex, without spine, on retrolateral side one spine (Fig. 26).

Female (IBSP 112230). Coloration as in male, except abdomen ventrally brownish. Total length 34. Carapace 15.8 long, 13.8 wide. Fovea procurved. Eye tubercle rectangular, 1 long, 2.2 wide. Eye sizes: AME 0.42, ALE 0.54, PME 0.32, PLE 0.42. Labium 2 long, 2.4 wide, with ca. 140 cuspules. Maxillae with ca. 330 cuspules each. Sternum 6.7 long, 5.7 wide. Cheliceral furrow with 11 teeth. Pedipalp, femur 8.4/ patella 5.1/ tibia 6/ tarsus 4.5/ total 24; Legs I: femur 9.4/ patella 5.2/ tibia 6.6/ metatarsus 8.5/ tarsus 4.2/ total 33.9; II: 11.8/ 7.1/ 8.8/ 6.8/ 4.2/38.7; III: 10.5/6.1/7.5/6.9/4/35; IV: 12.1/6/12/12.6/4.8/47.5. Spines: palp, femur p0-0-1, tibia v0-1r-2, p0-1-1. Leg I: femur d0-0-1p, tibia v0-1p-2, p0-0-1, r0-1-1; II: femur d0-0-1p, tibia v0-1r-1p, metatarsus v1-1-1; III: femur p0-0-1, tibia v0-1-2, metatarsus v1r-1r-2; IV: tibia v0-0-2, r1-1-0, metatarsus v1p-2-2, p0-1-0, r0-1-1-1-1. Metatarsi I–III with apical scopula, IV without. All tarsi with dense scopula, the leg IV with a large division of setae. Spermathecae with lobed seminal receptacles, close to the base (Fig. 28).

Material examined. BRAZIL, *Goiás*: Mineiros, Parque Nacional das Emas (18°6'23"S; 52°55'40"W), 1 female, 28/VII/1997, Valdujo and Nogueira leg. (IBSP 112230); *Mato Grosso do Sul*: Corumbá (19°00'33"S; 57°39'12"W), 1 male, 1999, Equipe UFMT leg. (IBSP 112228); Paraguay. No further data, 1 male, M.J. Bauab Viana leg. (IBSP 107926).

Distribution. Paraguay and Brazil: states of Goiás, Mato Grosso and Mato Grosso do Sul (Fig. 55).

Etymology. The species epithet is a noun in apposition taken from the type locality Mineiros, in the state of Goiás.

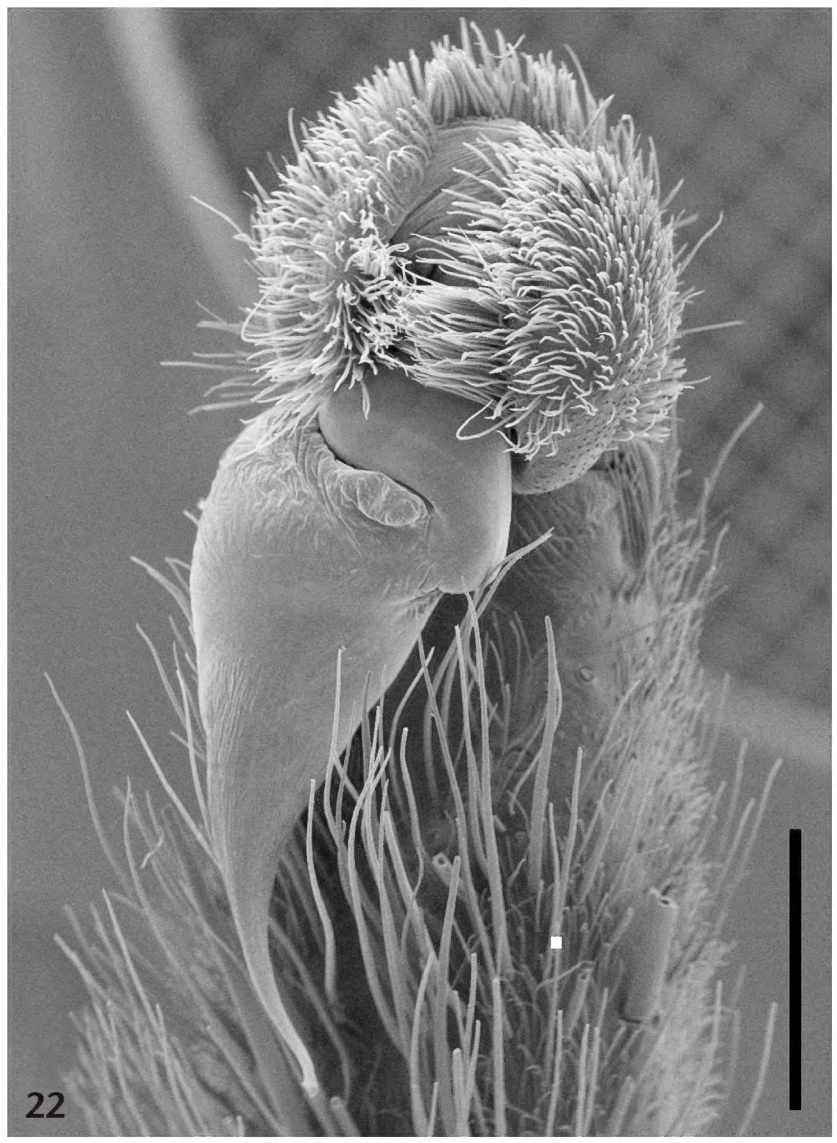
Bumba cuiaba sp. nov.

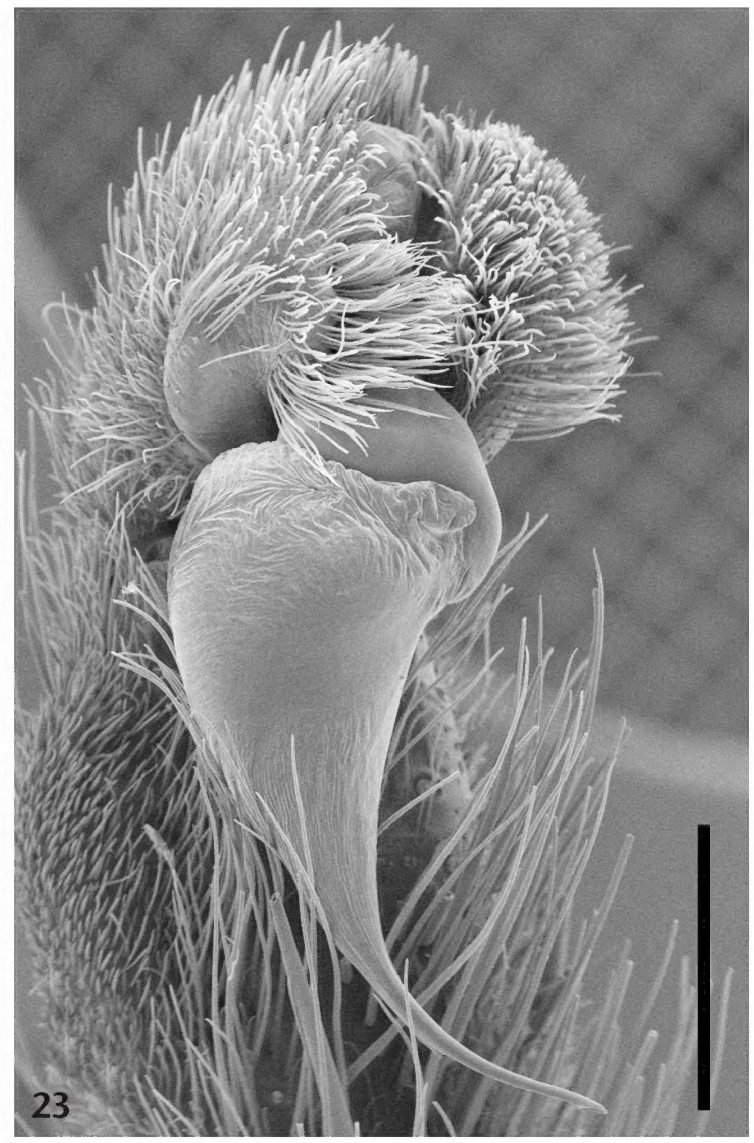
http://zoobank.org/03EE4D6F-B5F5-415F-8A85-B6EC130D62AE
Figs 29–35, 55

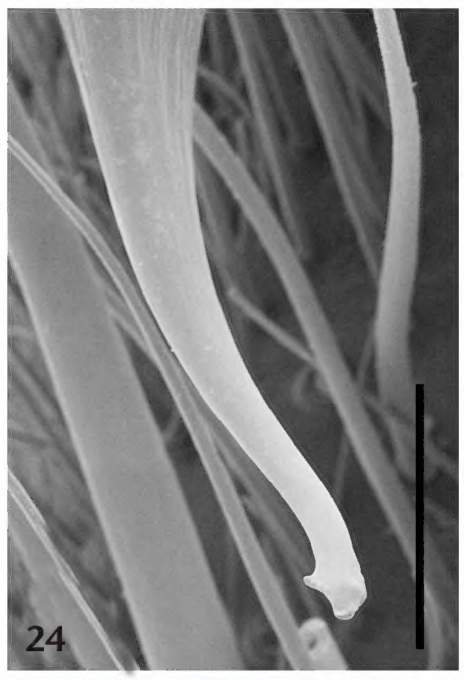
Type material. Holotype male from Jardim Santa Amália, Cuiabá (15°35'41"S; 56°05'48"W), Mato Grosso, Brazil, 11/XI/2018, A.K. Feitosa leg. (IBSP 221886). Paratype female from Usina Hidrelétrica de Manso (14°52'16"S; 55°47'47.7"W), Rio Manso, Chapada dos Guimarães, Mato Grosso, Brazil, 2000, Equipe Resgate Fauna leg. (IBSP 109108).

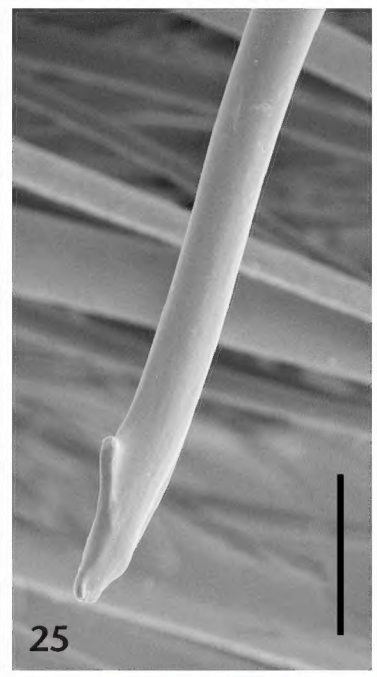
Diagnosis. *Bumba cuiaba* sp. nov. could be distinguished from all other species by the black longitudinal band of abdomen in males and females (Fig. 32). Males of *Bumba cuiaba* sp. nov. resemble *B. rondonia* sp. nov. and *B. mineiros* sp. nov. due to the curved embolus, but have shorter embolus and vestigial PS and PI (Figs 30–32, 34). Therefore, it resembles *B. horrida* due to the presence of a subapical spine on the retrolateral branch of tibial apophysis (Fig. 33), but can be distinguished by the slender embolus (Fig. 34). Females could be distinguished from the other species by the spermathecae with seminal receptacles with very short necks and two trilobed lobes on apex (Fig. 35).

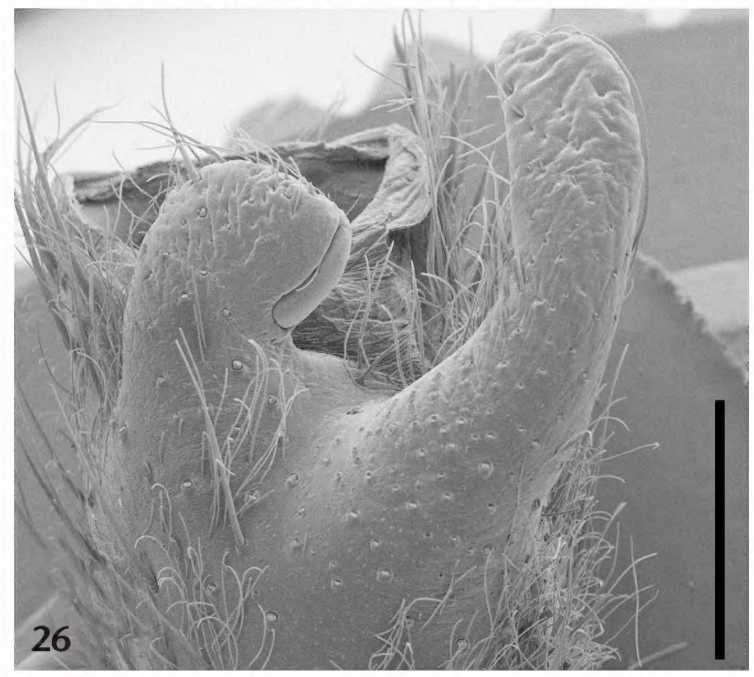
Description. Male (IBSP 221886). Color in ethanol: carapace, labium, sternum and legs covered by golden setae. Maxillae and ventral face of coxae orange. Abdomen dorsal side with a black longitudinal band, lateral sides covered by golden setae. Total length 22.8. Carapace 11.6 long, 9.6 wide. Fovea little procurved. Anterior eye row procurved, posterior recurved. Eye sizes: AME 0.36, ALE 0.44, PME 0.24, PLE 0.40. Labium 1.3 long, 1.6 wide, with less the 20 cuspules. Maxillae with ca. 100 cuspules each. Sternum 4.9 long, 4.2 wide. Cheliceral furrow with 11 teeth. Palp, femur 6/ patella 3.3/ tibia 4.2/ cymbium 2.1/ total 15.6. Legs I: femur 10.3/ patella 5.6/ tibia 8.7/ metatarsus 7.5/ tarsus 4.5/ total 36.6; II: 9.4/

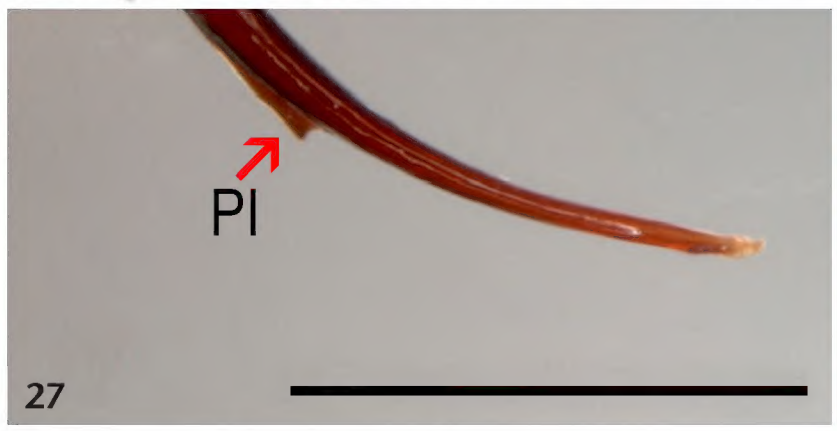


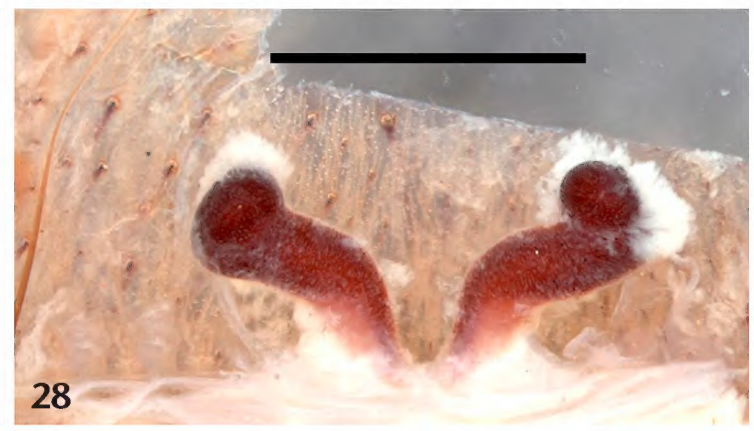




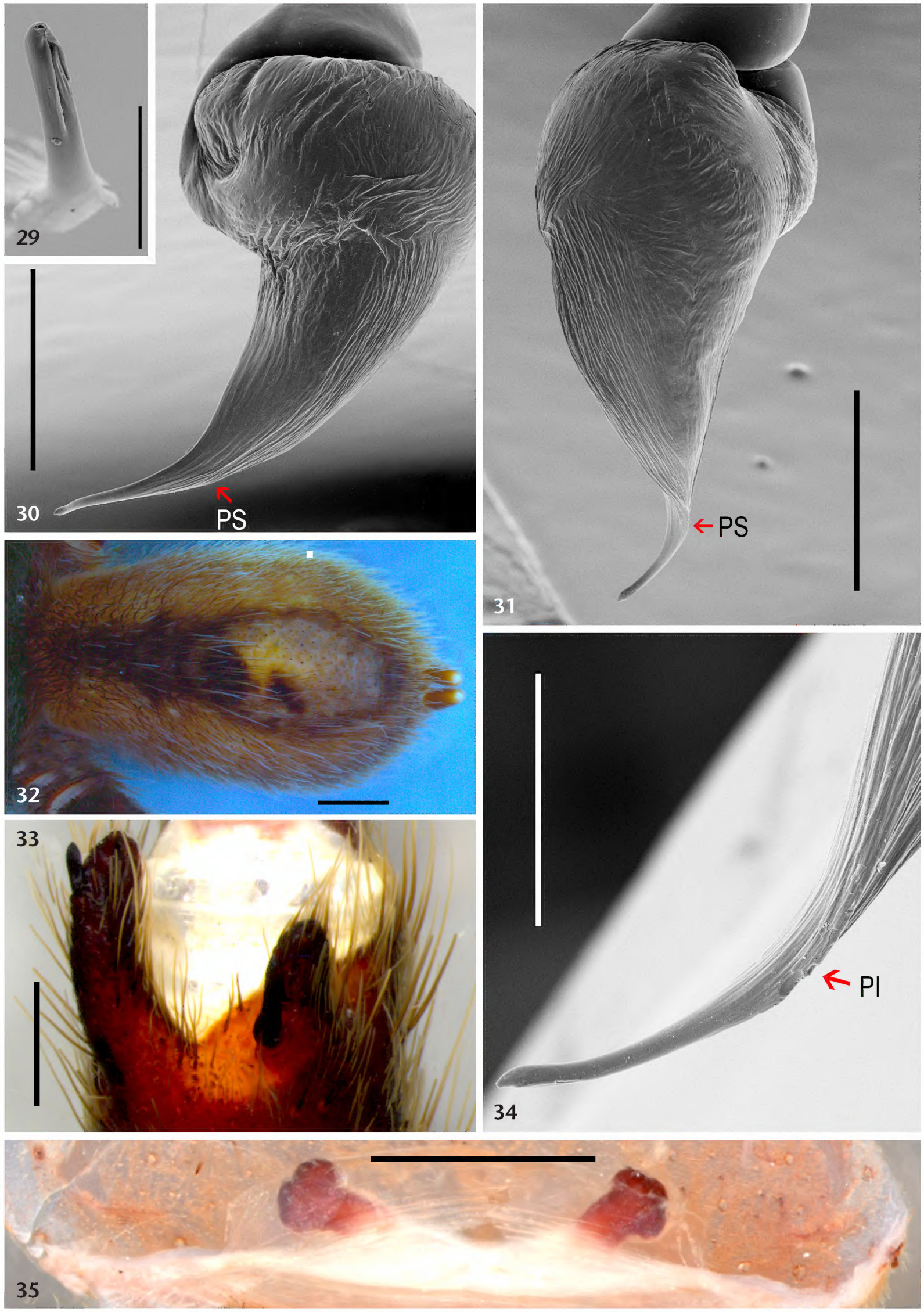








Figures 22–28. *Bumba mineiros* sp. nov. male and female, IBSP 112230: (22) palpal bulb in ventral view; (23) palpal bulb in prolateral view; (24, 25) detail of embolus tip; (26) tibial apophysis, left leg I, ventral view; (27) detail of embolus tip; (28) female genitalia. Scale bars: 22, 23 = 1 mm; 24, 25 = 100 µm; 26 = 1 mm; 27 = 100 µm; 28 = 500 µm.



Figures 29–35. *Bumba cuiaba* sp. nov. male IBSP 113755 and female IBSP 109108: (29) detail of embolus tip; (30) bulb in retrolateral view; (31) bulb in ventral view; (32) detail of abdomen, longitudinal row, male, dorsal view; (33) tibial apophysis, left leg I, ventral view; (34) detail of embolus tip; (35) female genitalia. Scale bars: 29 = 100 µm; 30, 31 = 500 µm; 32 = 2 mm; 33 = 1 mm; 34 = 300 µm; 35 = 500 µm.

4.6/ 7.1/ 6.6/ 4.3/ 32; III: 8.3/ 4.1/ 5.8/ 8.6/ 4.4/ 31.2; IV: 10.4/5/ 8.2/ 11.8/ 5.4/ 40.8. Spines: palp, tibia v0-1-0, p1-2-00; patella p0-1-0. Leg I: femur d0-1-2ap, p0-1-1, patella p0-1-0, tibia v2-2-0, p0-1-1, r1-1-0; metatarsus v0-1-1, p0-1-0; II: femur d0-1-0, p0-1-1-1, patella p0-1-0, tibia v2-2-0, p0-1-1, r1-1-0, metatarsus v0-1-1, p0-1-0; III: femur p0-0-1, r0-1-1, patella p0-0-1, tibia v1r-1r-2ap, p0-1-0, r0-1-0, metatarsus v1-1-1-2ap, p1-1-1-1, r1-1-1; IV: femur d0-0-2ap, tibia v1-1-2ap, p1-2-1-2-1, r1-1-1, metatarsus v1-1-1-1-2, p2-2-1-1-2, r1-1-1. Scopulae: tarsi I–III integrae, IV with longitudinal broad line of setae occupying almost the ventral side. Metatarsi I integrae, II–III until half, IV with only a small apical tuft. Palpal bulb with PI and PS vestigial (Figs 29–32, 34), tibial apophysis with a subapical spine on retrolateral branch and on retrolateral side of the same one strong spine (Fig. 33). Urticating setae of type III and IV present.

Female (IBSP 109108, paratype). Color in ethanol: cephalothorax orange, except chelicerae brown. Legs orange. Abdomen brown with pulmonary plate grayish, dark longitudinal band on dorsal side of abdomen like in males. Total length 24.9. Carapace 10.1 long, 8.6 wide. Fovea procurved. Eye tubercle 1 long, 1.7 wide. Eye sizes: AME 0.36, ALE 0.38, PME 0.32, PLE 0.24. Labium 1.2 long, 1.7 wide, with ca. 30 cuspules. Maxillae with ca. 100 cuspules each. Sternum 4.4 long, 4.1 wide. Cheliceral furrow with 12 teeth. Palp, femur 5.8/ patella 3.4/ tibia 3.6/ tarsus 3.3/ total 16.1. Legs I: femur 8/ patella 4.8/ tibia 5.3/ metatarsus 4.3/ tarsus 3.2/ total 25.6; II: 6.7/ 4.1/ 4.3/ 4.1/ 3.2/ 22.4; III: 5.6/ 3.2/ 4.1/ 5.6/ 2.7/ 21.2; IV: 7.2/ 4/ 6.1/ 7.8/ 3.2/ 28.3. Spines: palp, tibia d0-0-1, v1p-2-3ap. Leg I: femur d0-0-1, tibia v0-1-0, metatarsus v1p-1p-2ap; II: femur d0-0-1, tibia v1p-1p-3ap, metatarsus v1p-1p-3ap; III: femur d0-0-2, tibia v1r-2-3ap, p1-1-0, r1-1-0, metatarsus v2-2-3ap, p1-1-1-1, r0-1-1; IV: femur d0-0-1, tibia v1r-2-3ap, metatarsus v2-2-1-3ap, p1-1-1, r1-1-1-1. Metatarsi I–II with full scopula, III apical half, IV only apical. Scopulae: all tarsi scopulated, II with a small longitudinal band of setae, IV with a large band. Spermathecae with seminal receptacles apart from the base (Fig. 35).

Material examined. BRAZIL, *Rondônia*: Vilhena (12°44'26"S; 60°08'46"W), 2 males, VIII/1999, M.C. Carvalho leg., pitfall trap, cerrado area (IBSP 112339); *Mato Grosso*: Alta Floresta (9°52'32"S; 56°5'10"W), 8/VIII-17/IX/2012, J.S. Oliveira leg. (IBSP 244174); Sapezal (12°59'22"S; 58°45'52"W), 2 males, 2007, F.D. de Godoy leg. (IBSP 113755; IBSP 220067); Pontes e Lacerda/Vale de São Domingos, Rio Guaporé, UHE Guaporé (15°07"S; 58°58"W), 1 male, 1999, Equipe Resgate Fauna leg. (IBSP 111418).

Distribution. Brazil. States of Mato Grosso and Rondônia (Fig. 55).

Etymology. Species epithet is a noun in apposition taken from the city of Cuiabá, from the State of Mato Grosso, Brazil.

Bumba tapajos sp. nov.

http://zoobank.org/F6CAF1A9-B627-4303-8A46-F62763A81262

Figs 36–42, 55

Type material. Holotype male from Floresta Nacional do Tapajós (03°31'01"S; 55°04'23"W), Belterra, Pará, Brazil, X/2011, A.D. Brescovit et al. leg. (IBSP 218933).

Diagnosis. *Bumba tapajos* sp. nov. resembles *B. humile* due to the presence of a denticulate row (DR) on middle region of PI (Figs 36–40) but this is more evident and tibial apophysis with a subapical spine on retrolateral branch (Figs 41–42) absent in *B. humile*.

Description. Male (IBSP 213497). Color in ethanol: cephalothorax and legs red brown. Abdomen dorsally black and ventrally grayish. Total length 34.2. Carapace 17.8 long, 15.8 wide. Fovea procurved. Eye tubercle rectangular, 1.4 long, 2.6 wide. Anterior eye row procurved, posterior recurved. Eye sizes: AME 0.50, ALE 0.64, PME 0.42, PLE 0.46. Labium 2.2 long, 2.8 wide, with more than 100 cuspules. Maxillae with more than 260 cuspules each. Sternum 7.7 long, 7 wide. Cheliceral furrow with 11 larger teeth. Palp, femur 9.2/ patella 4.7/ tibia 8.3/ cymbium 3/ total 25.2. Legs: I: femur 15.3/ patella 8.2/ tibia 12.8/ metatarsus 11.3/ tarsus 6.2/ total 53.8; II: 14.5/ 7.6/ 11.3/ 11.4/ 5.8/ 50.6; III: 13.2/ 6/ 9.3/ 13.1/ 5.5/ 47.1; IV: 14.2/ 6.1/ 12.3/ 16.8/ 6.4/ 55.8. Spines: palp, tibia d0-0-1. Leg I: femur v1r-0-2-1r, p1-1-0, metatarsus v2-1-2-2, p0-1-1; II: tibia v1p-2-1-2, p1-1-0, metatarsus v1r-1r-2-1-1r, p0-1-1-1; III: femur d2-2-3, tibia v3-2-1r, p1-1-1-1-1, r1-1-1, metatarsus v1-2-2-1-2, p1-1-1-1, r1-1-1-1; IV: tibia 2-1-2-2, p1-1-0, r1-1-1-1, metatarsus v1-2-1-1-0, p1-1-1, r1-1-1-1. Male palpal bulb with embolus shorter than the tegulum, PI on middle region with 4, well-marked teeth, apical keel well developed (Figs 36–40). Tibial apophysis presenting a subapical spine on retrolateral branch (Figs 41–42). Scopulae on metatarsi I–II only apical, more evident laterally on both sides, III–IV without, all tarsi with dense scopulae, all integral, IV with a weakly longitudinal line of small setae.

Female. Unknown.

Material examined. BRAZIL, *Pará*: Belterra, Floresta Nacional do Tapajós (03°31'01"S; 55°04'23"W), two males, X/2011, A.D. Brescovit et al. leg. (IBSP 213497; IBSP 218931).

Distribution. Known only from the type locality (Fig. 55).

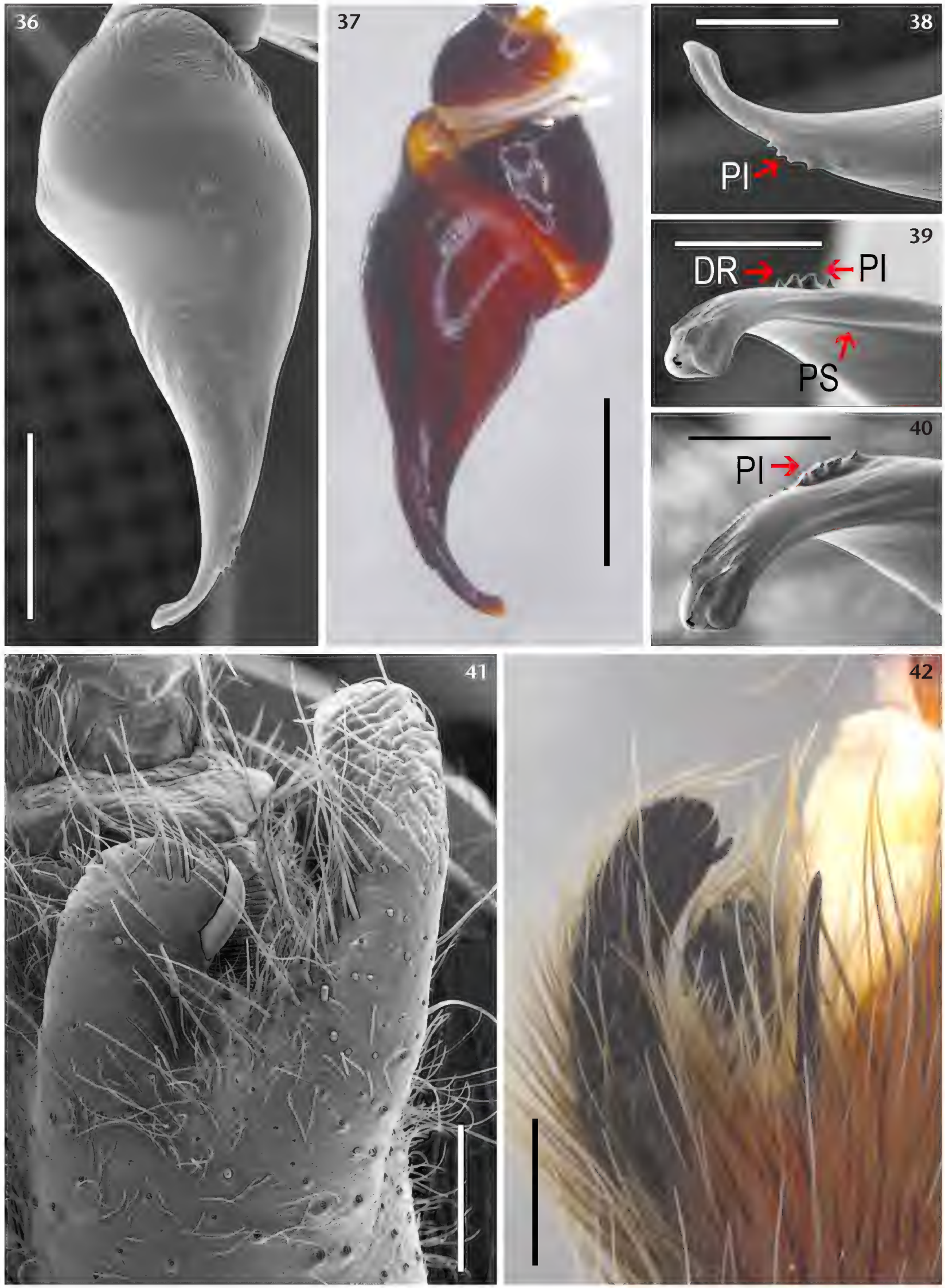
Etymology. The species epithet is a noun in apposition taken from the type locality.

Bumba lennoni Pérez-Miles, Bonaldo & Miglio, 2014

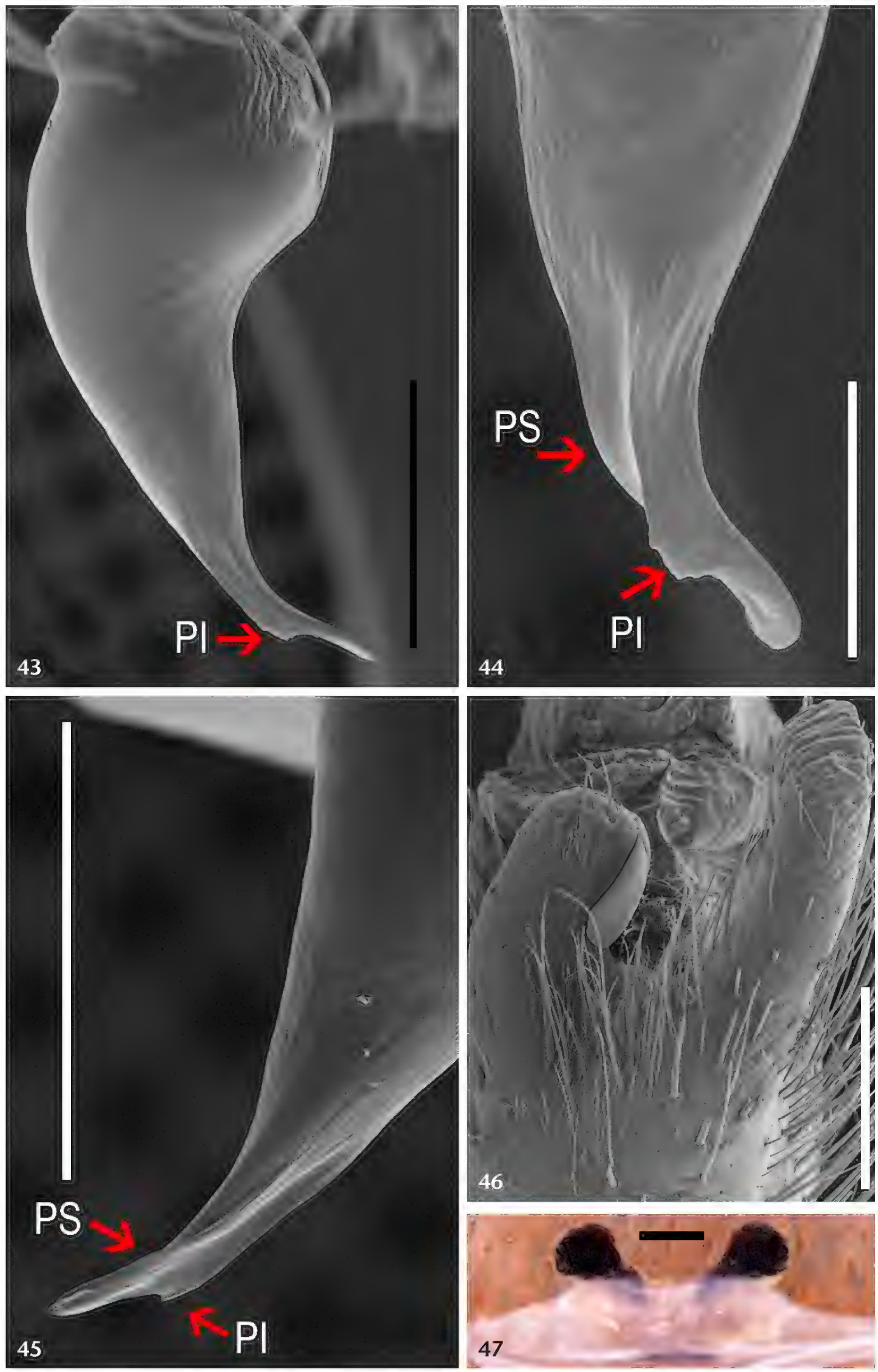
Figs 43–47, 55

Bumba lennoni Pérez-Miles, Bonaldo & Miglio, 2014: 3, figs 1-15 (Holotype male from Estação Científica Ferreira Penna (01°44'18.02"S; 51°27'48.01"W), FLONA Caxiuanã, Melgaço, Pará, Brazil, 02/VI/2003, J.A.P. Barreiros and C.O. Araújo leg., MPEG 983, not examined). Paratypes male (MPEG 001001) and female (MPEG 019039), with same data as the holotype, examined).

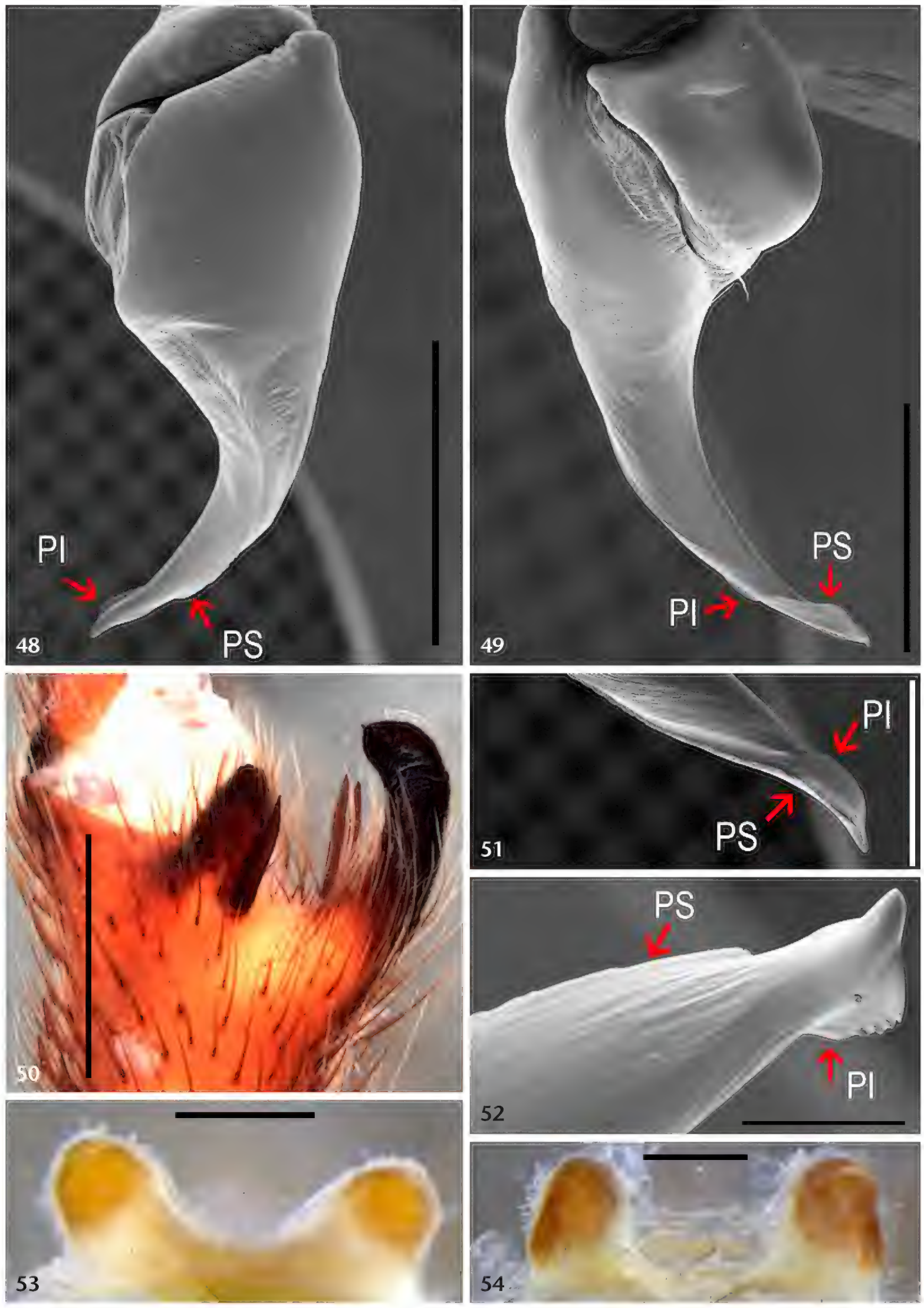
Diagnosis. *Bumba lennoni* resembles *B. horrida* by the enlarged distal area of embolus, but differ by the more numerous labial cuspules, about 50 (while *B. horrida* presents about 10); palpal bulb of males with very pronounced PS and PI, the inferior with a projection near the apex (Figs 43–45); branches of the tibial apophysis very different in size, with retrolateral branch



Figures 36–42. *Bumba tapajos* sp. nov. male, IBSP 213497: (36) bulb in retrolateral view; (37) bulb in prolateral view; (38, 39, 40) detail of embolus tip; (41) tibial apophysis, left leg I, ventral view; (42) tibial apophysis, left leg I, prolateral view. Scale bars: 36, 37 = 1 mm; 38, 39, 40 = 500 µm; 41, 42 = 2 mm.



Figures 43–47. *Bumba lennoni* male, IBSP 229902 and female IBSP 229498: (43) bulb in prolateral view; (44) bulb in dorsal view; (45) detail of embolus tip; (46) tibial apophysis, left leg I, ventral view; (47) female genitalia. Scale bars: 43 = 1 mm; 44 = 400 µm; 45, 46 = 1 mm; 47 = 500 µm.



Figures 48–54. *Bumba horrida* male IBSP 101117, IBSP 229497 and female IBSP 10117, IBSP 229497: (48) bulb in retrolateral view (IBSP 101117); (49) bulb in prolateral view (IBSP 229497); (50) tibial apophysis, left leg I, retrolateral view (IBSP 229497); (51, 52) detail of embolus tip (IBSP 101117); (53) female genitalia (IBSP 229497); (54) female genitalia (IBSP 101117). Scale bars: 48 = 1 mm, 49 = 2 mm; 50, 51 = 1 mm; 52 = 300 µm; 53 = 500 µm, 54 = 2 mm.

without subapical spine (Fig. 46). Females differ from *Bumba horrida* by the spermathecae with receptacles emerging from a shorter and straight neck (Fig. 47).

New record. BRAZIL, *Pará*: Brejo Grande do Araguaia (5°41'56"S; 48°24'46"W), Fazenda Campo Alegre, two males, 22/IX/2015, R.M.F. Guedes leg. (IBSP 229902-229903); with same data, two females (IBSP 229498–IBSP 229499).

Distribution. Brazil, state of Pará (Fig. 55).

Bumba horrida (Schmidt, 1994)

Figs 48–54, 55

Paraphysa horrida Schmidt, 1994: 2, fig. 1 (Holotype female, from north of Brazil, Rechtsteiner leg., in Senckenberg Museum Frankfurt, Germany, SMF 38040, not examined); Peters 2000: 72, fig. 200; Peters 2003: 258, figs 1034, 1039–1041; Schmidt 2003a: 12, figs 1–3; Schmidt 2003b: 182, fig. 460.

Iracema cabocla Pérez-Miles, 2000: 142, figs 1–7 (Holotype male from Ilha de Maracá (2°49'10"N; 60°40'17"W), Amajari, Roraima, Brazil, 18/VII/1987, S. Bowles leg. (INPA 0056), examined; paratypes: 1 male and 2 females, 24/VII/1987, same collector and locality as holotype (INPA), examined; Bertani and Carla-da-Silva 2003: 6, figs 6-9; Schmidt 2003b: 124, figs 90-92. **New synonymy**.

Iracema horrida: Bertani and Carla-da-Silva 2003: 2, figs 1–5,10.

Bumba horrida: Pérez-Miles, Bonaldo and Miglio 2014: 1.

Bumba cabocla: Pérez-Miles, Bonaldo and Miglio 2014: 2.

Synonymy. Recently we received larger number of couples of the *Bumba* from Ilha de Maracá, the type locality of *B. cabocla*. We observed males measuring only 25 mm until 45 mm, and females at 50 mm. Also the number of labial cuspules present variation from 0-20. Comparing details of the tip of embolus and tibial apophysis of the male palp bulb and female receptacles of the spermathecae of these specimens with those presented by Bertani and Carla-da-Silva (2003, figs 1–4; 6–9), these are quiet indistinct. The female presented by Pérez-Miles (2000, fig. 7) it is rather an immature specimen, as shown in fig. 8F. So, we proposed here the synonymy of these species.

Diagnosis. *Bumba horrida* differs from *Bumba humile* by the having fewer labial cuspules, between 0–20, male palpal bulb with PS expanded near the apex, presenting a subapical lobe (Figs 48–49, 51–52) and tibial apophysis with retrolateral side of the retrolateral branch with one strong spine (Fig. 50). Female spermathecae with two receptacles originating from a large base and enlarged neck (Figs 53–54).

Material examined. BRAZIL, *Roraima*: Cantá (2°36'30"N; 60°35'46"W), Serra Grande, 22/VI/2014, 1 male (IBSP 229496), 1 male (IBSP 229493), 1 male (IBSP 229495), 2 males 1 female

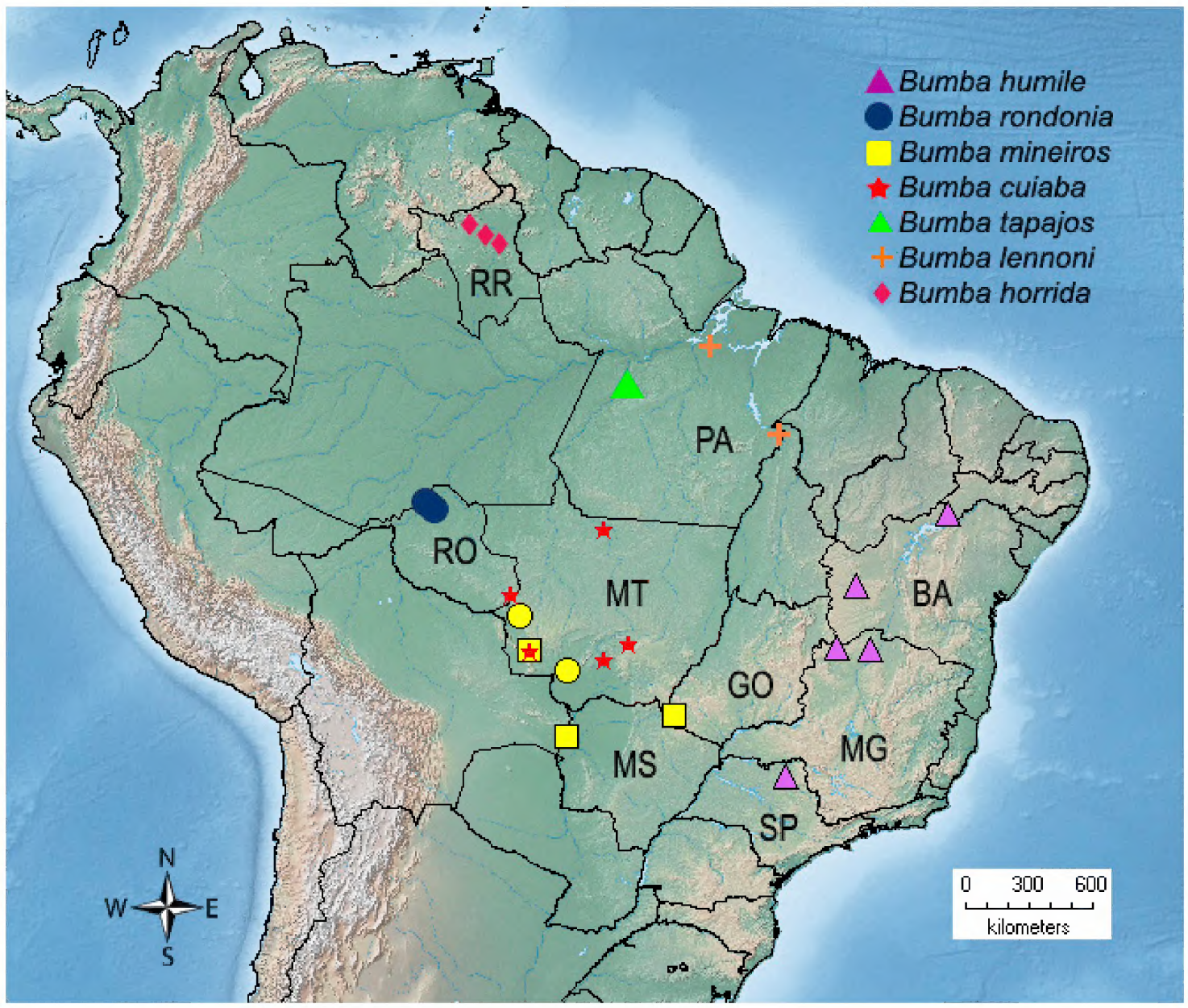


Figure 55. Distribution map of *Bumba*.

Figures 56–61. *Bumba humile* (IBSP): (56, 57) male juvenile; (58, 59) adult, body coloration in live specimen; (60, 61) habitat, Brasil, Bahia, São Desidério. Photo: Victor M. Ghirotto.

(IBSP 229497), 1 male (IBSP 229494), all collected by J. Cabra, L. Carvalho and M. Schneider; Amajari, Ilha de Maracá (2°49'10"N; 60°40'17"W), 28-30/X/2019, F.L. Franco leg., 7 males 2 females 11 imm. (IBSP 247389-247392); Alto Alegre (2°58'48"N; 61°17'31'W), 26-27/X/2019, F.L. Franco leg., 2 males 1 female 2 imm. (IBSP 247393).

Distribution. Brazil, states of Amazonas and Roraima, and Venezuela (Bertani and Carla da Silva, 2003; Fig. 55).

Cyclosternum pulcherrimaklaasi (Schmidt, 1991), comb. nov.

Paraphysa pulcherrimaklaasi Schmidt, 1991: 8, figs 1, 3–4 (Holotype male from Ecuador, A. Tinter leg., in Senckenberg Museum, Frankfurt, Germany, SMF 38040, not examined); Schmidt 1993: 92, figs 259, 268–269;
Phrixotrichus pulcherrimaklaasi: Schmidt 1994: 5; Schmidt 1997: 17, figs 83, 85.
Euathlus pulcherrimaklaasi: Peters 2003: 173, figs 685–688; Schmidt 2003b: 163, figs 256, 353–354.
Maraca pulcherrimaklaasi: Perafán and Pérez-Miles 2014: 2413.
Bumba pulcherrimaklaasi: Pérez-Miles, Bonaldo and Miglio 2014: 2.

Remarks. Schmidt (1991) described the species based on a male from the rain forest of Ecuador with no further information. Perafán and Pérez-Miles (2014) examined the specimen, which nowadays lacks the palpal organ and the authors considered that the figure of Schmidt (1991) of the palpal bulb was not clear enough to identify it. The presence of retrolateral node on the palpal tibiae, presence of urticating setae of type III and IV and besides other characters of generic seems the authors to be a *Bumba* and so the species is transferred. The aspect of the male palpal bulb (Schmidt 1991, fig. 1) represented by a short embolus differs from species of *Bumba* which present a long and thin embolus (see Figs 8, 15–18). Moreover, the presence of retrolateral nodule in the tibia of the palpus does not occur in species of the genus *Bumba*, but occurs in males of *Cyclosternum*. These characters show that this species resembles several species of *Cyclosternum* that occur in Ecuador which present a similar aspect of the male palp. We propose the transference of *B. pulcherrimaklaasi* to *Cyclosternum*.

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